



Company: Noble Energy
Lease / Well: Dinner / 14-14
API#: 05-123-21946
Rig Name: Production / Lightning Wireline
State / County: Colorado / Weld County
Latitude: 40.487, Longitude: -104.623
GRID North is 0.570 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: inrun_ed.ut

Minimum Curvature Method

Report Date/Time: 10/5/2011 / 09:26

Vaughn Energy Services
Henderson, CO
303-853-4976
Robert Davis

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N-S FT	+E-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.094	41.984	100.000	0.061	0.055	0.061	0.082	41.984	0.094
200.000	0.078	91.663	200.000	0.121	0.179	0.121	0.216	55.994	0.074
300.000	0.164	188.956	300.000	-0.023	0.225	-0.023	0.226	95.740	0.190
400.000	0.115	180.087	399.999	-0.264	0.202	-0.264	0.333	142.563	0.053
500.000	0.374	93.791	499.999	-0.387	0.528	-0.387	0.654	126.238	0.384
600.000	0.432	100.838	599.996	-0.479	1.223	-0.479	1.313	111.393	0.076
700.000	0.430	97.928	699.993	-0.602	1.964	-0.602	2.054	107.029	0.022
800.000	0.419	80.508	799.991	-0.593	2.696	-0.593	2.760	102.406	0.129
900.000	0.391	74.262	899.988	-0.440	3.384	-0.440	3.413	97.413	0.052
1000.000	0.387	68.030	999.986	-0.222	4.026	-0.222	4.032	93.149	0.042
1100.000	0.433	66.327	1099.983	0.057	4.685	0.057	4.685	89.309	0.047
1200.000	0.521	43.901	1199.980	0.535	5.346	0.535	5.373	84.280	0.204
1300.000	0.341	50.666	1299.977	1.051	5.891	1.051	5.984	79.881	0.186
1400.000	0.343	59.909	1399.975	1.390	6.380	1.390	6.529	77.710	0.055
1500.000	0.396	45.368	1499.973	1.782	6.884	1.782	7.111	75.485	0.107
1600.000	0.609	52.211	1599.969	2.351	7.550	2.351	7.907	72.706	0.221
1700.000	0.600	44.922	1699.964	3.048	8.340	3.048	8.880	69.928	0.077
1800.000	0.576	40.831	1799.958	3.799	9.039	3.799	9.805	67.204	0.049
1900.000	0.474	9.146	1899.954	4.587	9.433	4.587	10.489	64.067	0.303
2000.000	0.492	24.899	1999.951	5.384	9.680	5.384	11.076	60.914	0.133
2100.000	0.356	20.031	2099.948	6.066	9.967	6.066	11.668	58.675	0.140
2200.000	0.366	19.697	2199.946	6.659	10.181	6.659	12.165	56.813	0.010
2300.000	0.358	28.351	2299.944	7.235	10.437	7.235	12.699	55.272	0.055
2400.000	0.181	19.312	2399.943	7.659	10.638	7.659	13.108	54.247	0.181
2500.000	0.136	345.814	2499.943	7.923	10.661	7.923	13.283	53.379	0.101
2600.000	0.150	5.008	2599.942	8.169	10.643	8.169	13.417	52.491	0.050
2700.000	0.178	2.031	2699.942	8.455	10.660	8.455	13.606	51.582	0.029
2800.000	0.282	24.132	2799.941	8.834	10.766	8.834	13.927	50.629	0.135
2900.000	0.329	23.026	2899.940	9.323	10.979	9.323	14.404	49.663	0.047
3000.000	0.380	23.183	2999.938	9.893	11.222	9.893	14.960	48.602	0.051
3100.000	0.381	22.980	3099.936	10.504	11.483	10.504	15.562	47.548	0.002
3200.000	0.523	47.041	3199.933	11.121	11.947	11.121	16.322	47.049	0.234
3300.000	0.554	50.982	3299.928	11.737	12.656	11.737	17.261	47.159	0.048
3400.000	0.401	25.736	3399.925	12.356	13.184	12.356	18.069	46.856	0.257

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
3500.000	0.345	115.595	3499.923	12.541	13.607	12.541	18.505	47.336	0.528
3600.000	1.130	146.703	3599.915	11.587	14.420	11.587	18.498	51.218	0.853
3700.000	1.470	148.188	3699.889	9.673	15.637	9.673	18.387	58.260	0.342
3800.000	1.779	148.288	3799.848	7.262	17.129	7.262	18.605	67.024	0.310
3900.000	1.844	151.695	3899.798	4.525	18.709	4.525	19.248	76.404	0.126
4000.000	1.381	148.111	3999.759	2.085	20.108	2.085	20.216	84.081	0.474
4100.000	1.512	154.078	4099.727	-0.125	21.322	-0.125	21.322	90.335	0.199
4200.000	1.438	164.230	4199.694	-2.519	22.239	-2.519	22.381	96.461	0.271
4300.000	1.311	168.134	4299.665	-4.846	22.815	-4.846	23.324	101.991	0.157
4400.000	1.418	168.234	4399.637	-7.177	23.303	-7.177	24.383	107.118	0.106
4500.000	1.182	176.173	4499.611	-9.417	23.624	-9.417	25.432	111.733	0.296
4600.000	1.055	178.050	4599.592	-11.366	23.724	-11.366	26.306	115.598	0.132
4700.000	0.912	195.097	4699.577	-13.054	23.548	-13.054	26.924	119.002	0.324
4800.000	0.879	201.425	4799.565	-14.536	23.061	-14.536	27.260	122.225	0.104
4900.000	0.687	198.843	4899.556	-15.817	22.587	-15.817	27.575	125.003	0.195
5000.000	0.712	196.201	4999.548	-16.982	22.220	-16.982	27.966	127.389	0.041
5100.000	0.526	196.575	5099.542	-18.018	21.916	-18.018	28.372	129.426	0.186
5200.000	0.208	217.746	5199.540	-18.602	21.674	-18.602	28.562	130.639	0.340
5300.000	0.120	300.084	5299.540	-18.693	21.472	-18.693	28.469	131.042	0.226
5400.000	0.177	358.248	5399.540	-18.486	21.376	-18.486	28.261	130.853	0.153
5500.000	0.537	33.690	5499.538	-17.941	21.631	-17.941	28.103	129.673	0.406
5600.000	0.885	55.596	5599.530	-17.115	22.528	-17.115	28.292	127.225	0.435
5700.000	0.503	68.004	5699.523	-16.515	23.572	-16.515	28.781	125.016	0.408
5800.000	0.245	101.437	5799.520	-16.393	24.188	-16.393	29.220	124.127	0.327
5900.000	0.055	352.320	5899.520	-16.388	24.392	-16.388	29.386	123.896	0.268
6000.000	0.508	280.205	5999.519	-16.262	23.949	-16.262	28.948	124.178	0.494
6100.000	0.840	282.669	6099.512	-16.023	22.798	-16.023	27.865	125.101	0.333
6200.000	1.419	290.744	6199.492	-15.424	20.925	-15.424	25.995	126.394	0.599
6300.000	1.525	287.873	6299.459	-14.577	18.501	-14.577	23.554	128.235	0.129
6400.000	1.514	283.674	6399.424	-13.856	15.951	-13.856	21.129	130.981	0.112
6500.000	2.212	288.103	6499.370	-12.944	12.832	-12.944	18.227	135.249	0.712
6600.000	1.780	287.555	6599.309	-11.876	9.517	-11.876	15.219	141.293	0.433
6700.000	1.547	288.214	6699.267	-10.986	6.754	-10.986	12.896	148.418	0.234
6800.000	2.485	293.172	6799.204	-9.710	3.478	-9.710	10.315	160.293	0.953
6900.000	1.820	304.164	6899.134	-7.965	0.171	-7.965	7.967	178.772	0.780

<div> HORIZONTAL DISPLACEMENT IS 7.967 FEET AT 178.772 DEGREES </div>
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